

EEE 425/591: Digital Systems and Circuits (Spring 2010)

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Meeting Times: LL 60. Tuesday and Thursday: 1:30 - 2:45pm.

Office hours: Tuesday and Thursday 2:45-3:45pm, Wednesday 1:00-2:00pm in GWC 418.

Course Objective: To be able to analyze and design digital integrated circuits.

Course Description: Digital logic gate analysis and design. Propagation delay times, fan out, power dissipation, noise margins. Design and analysis of CMOS circuits – combinational and sequential logic circuits. MOS memories. VLSI circuits. Cadence for circuit layout and simulation.

Pre-requisite: ECE 334.

Class Website: <https://myasucourses.asu.edu/>

Textbook: Jan M. Rabaey et. al., *Digital Integrated Circuits: A Design Perspective*, Prentice Hall, <http://bwrc.eecs.berkeley.edu/IcBook/>

Topics:

1. Basics of CMOS Logic Gates
2. CMOS Processing, Layout, Design Rules
3. Modeling MOS transistors
4. CMOS Inverter – Delay, Power
5. Design of Combinational Logic Circuits – Static and Dynamic
6. Logical Effort
7. Design of Sequential Logic Circuits
8. Arithmetic Building Blocks: Adders
9. Memories: SRAM
10. Processor Architecture

Laboratory: The laboratory is located in GWC 273. There are 5 laboratory assignments using Cadence Tool Suite. Details of the laboratory assignments, due dates, etc. will be posted on the class website.

Homework: The homework assignments will be posted on the class website. There will be around 6-7 homework assignments; the lowest score will be dropped. Homework is to be turned before the start of class on the due day. Late submissions will not be allowed. For complete credit, show your work and box the answer. Students may work together on the homework, but copying is unacceptable.

Grading: The plus/minus grading system will be used.

The distribution of marks is as follows: Homework assignments: 10%, Laboratory assignments 20%, Test 1: 20%, Test 2: 20%, Final: 30%.

Exam Schedule: Test 1 will be held on March 4 and Test 2 will be held on April 22. The final exam will be held on May 11. There will be no make-up tests.